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OBITUARY

Albert Russell (Bert) Main

Born: 6 March 1919

Died: 3 December 2009

Bert Main (1919–2009) was recognized both nationally and internationally as one of Australia's leading zoologists and a gifted naturalist. His research and ecological teaching on a wide variety of animals, including frogs, reptiles, birds, insects and marsupials laid the foundations for three generations of graduate students who were inspired by his imagination and biological insight. His foresight and energy as an administrator on government bodies also led to the creation of some of Western Australia's most important National Parks and Nature Reserves that are vital for the preservation of Australia's rich biodiversity and form part of his enduring legacy.

Bert Main died peacefully on 3 December 2009 after a period of failing health. With his passing, Australia has lost one of



Bert Main as Chair of the Environmental Protection Authority (EPA) in WA in 1983.

Adapted with permission from S.D. Bradshaw, *Historical Records of Australian Science*, 22 (2011) 104–125.

its pioneer ecologists who went on to translate his knowledge of this country's rich wildlife into practical methods and means for its long-term preservation. He was appointed as a Lecturer in Zoology at The University of Western Australia (UWA) in 1952 on the recommendation of the then Professor, Harry Waring, prior to receiving his PhD on frog systematics and evolution in 1956. He was promoted to Reader in 1961 and awarded one of UWA's first Personal Chairs in 1967. Bert's primary research was on Australian frogs and their evolution but he was first and foremost a superb naturalist; his knowledge of the Australian flora and fauna in its natural and geohistorical setting was legion. This led him to supervise over 30 postgraduate students on organisms ranging from blennioid fish, tortoises, dragon lizards, marsupials, mountain ducks, arthropods and pitcher plants as well as the effect of phenomena including fire on the biota.

From his earliest days Bert believed in taking science to the public. He was a member of the Western Australian Naturalists' Club and his first publication in 1947 (1) was on the artificial propagation of the parasitic Christmas tree, *Nuytsia floribunda*. He was very active in Club affairs in the 1950s and was President from 1949–50 and 1963–55; Vice President from 1955–56 and a Council Member from 1956–57. He was made an Honorary Life member in 1957 and made a Joint Patron with his wife



Bert in jocular mood!

Barbara in 1999. His commitment to enthusing others about natural history and ecology is reflected in the publication, in 1954, of two of the early WA Naturalists' Club Handbooks (2,3), followed by *The Frogs of Southwestern Australia* in 1965 (4) and a revised and updated edition of Handbook No 4, *A Guide for Naturalists*, with Don Edward in 1968 (5). He also convened with Dom Serventy an extensive appraisal of Kings Park as an indigenous nature reserve by WA Naturalists' Club members that was published in 1957 and now provides an important early record of Perth's most important bushland remnant (6).

Bert was born on 6 March 1919 in Perth and spent his childhood at Caversham in the Swan valley, an area that was then close to undeveloped bushland. His father, Alexander Russell Main, had been gassed in the First World War and, despite a back injury, maintained a small vineyard in the Swan Valley with the help of his mother, Agnes (née Mylam). Bert was the eldest of three children, with his sister Beth and brother Keith, and credits his maternal grandfather, Albert Mylam, with having given him a love of the bush by taking him regularly on long walks. The vineyard was, however, sold and the family moved to Bassendean where Bert attended Midland State School and took his Junior Exam in 1934. His first job at the age of 15 was as a messenger boy in the Department of Agriculture in East Perth, rising to become an assistant to a number of the officers, helping them with filing and, among other tasks, sorting seeds.

His career with the armed forces started at the age of 18 when he enrolled in the Citizens' Military Force (CMF), better known then as the 'Reserve' or 'Militia'.

Bert was marked for life, both physically and mentally, by his wartime experiences, which ended with him as an inmate in a German Prisoner of War (POW) camp. After the outbreak of war he transferred from the CMF to the 11th Infantry Battalion of the AIF in February 1943. Bert remarked later that the mindless routine of army life was not for him and he enlisted in the RAAF and became a



Bert and Barbara Main in the Zoology Department of UWA in 1956

Flight Sergeant and later a Warrant Officer. His early training as a navigator was in South Australia from where he was transferred to Wolverhampton in the UK to continue his training and commenced flying operations over Europe in 1944 as a navigator in Lancaster bombers. His aeroplane was shot down over Germany early in 1945 and he and the other crew members were able to parachute from the burning craft. Bert strained his back on landing and spent the next week scrounging for food and attempting to get to relative safety in Holland. Contrary to RAF instructions, he hid one night in a farm haystack because of the intense cold. Aircrew were told expressly not to seek refuge in haystacks as these were a favourite target of strafing fighters. Unfortunately, the farmer on



Bert in the field

whose land he was, discovered him the next morning and rendered him to the German authorities.

He was taken as prisoner to Stalag VII/A (Kriegsgefangenen-Mannschafts-Stammlager), a POW camp that was located north of the town of Moosburg in southern Bavaria. Bert's stay in the camp was not long but one can gauge the conditions from the fact that his weight fell from his normal 12 stone (76 kg) to a little under 7 stone (43 kg) on his release. In the camp Bert managed to fashion a knife and spoon which he used to apportion rations to the 14 inmates in his hut. Why Bert was given this responsibility is unclear, but he

maintained it was because he was the only one who had a knife and that ended any arguments!

On being repatriated, Bert first spent time at a rehabilitation hospital in Yanchep, recuperating from a duodenal ulcer and debility provoked by conditions in the POW camp. He returned to his old position with the Department of Agriculture and matriculated at night school from the City Commercial College, being Dux of his year in 1946. Along with many other POWs, he benefited from the Commonwealth Reconstruction Training Scheme (CRTS) established to assist returning servicemen. He then enrolled in 1947 at The University of Western Australia for a Science degree. This was the last year of G. E. Nicholls' tenure as Professor of Biology. The following year, Harry Waring arrived from the UK and was appointed to the Foundation Chair of Zoology at UWA.

Bert was awarded a Fulbright Scholarship to study in the United States in 1950 and left before he had completed and submitted his Honours thesis. He studied at the University of Chicago under Tom Park and Sewell Wright, the latter greatly influencing his thinking on genetics. He also met and was befriended by the 'greats' of ecology and evolution of the time, some of whom he studied under – George Gaylord (GG) Simpson, Theodore Dobzhansky (Doby), Warder Clyde Allee, Alfred Emerson, Karl Schmidt and Orlando Park. On his return trip, Bert went *via* the UK and visited Charles Elton's *Bureau*



John Kelsall, Bert Main and Dick Sadlier in a flight over the Abrolhos Islands

of *Animal Population* in Oxford where he also studied with Arthur Cain and E.B. Ford, with whom he was impressed by his groundbreaking work on polymorphism. Bert returned to WA late in 1951 and hurriedly put together and submitted his Honours thesis, for which he was awarded First Class Honours – graduating in 1952 and then appointed to a Lectureship in Zoology under Harry Waring. Bert had met Barbara York as a first-year student in Zoology in 1947 and they were married on 12 April 1952. Barbara went on to have her own distinguished career as a zoologist, focusing on trapdoor spiders of which she has become a world authority, and also a creative writer of distinction¹. Bert and Barbara

had three children, Rebecca (born 1956), Gilbert (1960) and Monica (1963). None has become a professional zoologist, but all have a deep love of nature and the environment that they owe to their parents.

Bert's PhD thesis, submitted in April 1955, was entitled: "Some aspects of the evolution and speciation of the Western Australian fauna as illustrated by the genus *Crinia* (Anura, Leptodactylidae)" and was a slim volume of some 87 pages. It is noteworthy that he was already focused on the Australian fauna, and frogs were merely being treated as a case study. He deliberately chose frogs as his object of study because....

"I had formed the view that because of the unprotected

¹ See, for example Main, B.Y. *Between Wodjil and Tor* Jacaranda Press, 1967

nature of their skin, frogs would be useful organisms in evolutionary studies as it was believed, at the time, that speciation in some of the biota had been promoted by a great aridity in the geologically recent past.”(7).

Bert's research on the amphibian fauna of Western Australia was groundbreaking. New species were discovered and described using the new methodology based on male calls and culminated in a major review paper on the ecology, systematics and evolution of Australian frogs (8). These papers alone would have been enough to cement his reputation as one of Australia's leading herpetologists

and merited his election as an Honorary Foreign Member of the American Society of Ichthyologists and Herpetologists (ASIH) in 1975.

One of Bert's most important and influential papers on amphibian ecology and evolution appeared in 1958 with Murray Littlejohn and Tony Lee in the international journal, *Evolution* (9). The paper attempted to resolve the paradox of why there are so many more species of frogs in western than in eastern Australia, despite the topographic monotony of the WA landscape and the absence of obvious barriers to gene flow such as rivers and mountains. All conventional theories of speciation at the time were based



Bert Main, Ernest Hodgkin, Harry Waring and Knut Schmidt-Nielsen next to the Zoology Department's DeSoto field vehicle in the late 1950s.

on allopatric separation of gene pools by physical barriers, and the WA situation flew in the face of this. In this paper the authors identified multiple species in the genera *Hyla*, *Neobatrachus*, *Heleioporus*, *Crinia* and *Pseudophryne* with corresponding species pairs in the eastern states and then erected a novel hypothesis based on successive migrations of frog species during wet (pluvial) periods of the Pleistocene. This hypothesis"envisaged Western Australia as a peninsula from which the fauna of south-eastern Australia is now isolated by desert but into which components of the south-eastern fauna could migrate when the intervening country was less arid than it is now." (8). Bert's very original hypothesis was inspired by the early work with birds of Serventy and Whittell (10) and based on the series of ice ages in the northern hemisphere that were translated into wet pluvial periods in southern Australia, joining eastern and western Australia across the barren desert area that is now the Nullarbor. If one took the basic eastern species in any one genus and multiplied by the three postulated migrations, one ended up miraculously with the number of species in the west!

Bert built up a stable of postgraduate students at this time in the '60s and '70s – all working on aspects of marsupial ecology and physiology. Graham Brown, Shelley Barker, Bob Prince, Jack Kinnear, Bill Holsworth, Glen Storr, Tim Ealey, John Kelsall and John Sampson – all of whom went on to have distinguished careers in

zoology. Although Bert himself was exposed to the Allee 'school' of ecology during his period in the United States (11), he was firmly of the opinion that ecology could not be taught, only discovered when one had some raw data in hand. He believed that slavishly following a text led only to the imprinting of students with one or other of the competing 'schools' of ecology current at that time (12).

Bert's extraordinary involvement in the practical application of science to the problems of environmental management in Western Australia was to commence in the late 1950s and continue long after his retirement from UWA in 1983. His work focusing on the protection of wildlife commenced as a member of the state Fauna Protection Advisory Committee (FPAC) and developed as a member of the WA sub-committee of the National Parks Committee, established by the Australian Academy of Science in 1958. The report from this committee, *National Parks and Nature Reserves in Western Australia*, published by the Academy in 1965, recommended the creation of what are now WA's best known and most important national parks and nature reserves – Prince Regent Nature Reserve, Karajini (Hamersley Range) National Park, Great Victoria Desert Nature Reserve, Nuytsland Nature Reserve and Drysdale River National Park.

The FPAC was replaced by the WA Wildlife Authority in 1968 and Bert became a founding member, continuing in this rôle until

the Authority was superseded under the Conservation and Land Management Act of WA in 1985. He was also a Foundation Member of the Western Fisheries Research Committee, established by the WA Government in 1959 to regulate all commercial fisheries in the State. Bert's rôle here was to regularly review and evaluate all research proposals by staff of the then Department of Fisheries and Wildlife.

Bert's most important contribution though was undoubtedly as a founding member of the Environmental Protection Authority (EPA) that was established in 1972, becoming its Deputy Chair in 1981, then Chairman from 1982 until his retirement in 1985. One of the EPA's first decisions was to set up a Conservation Through Reserves Committee (CTRC) that ultimately resulted in the creation of numerous reserves, including Rudall River, Peak Charles, d'Entrecasteaux, Shannon and Millstream-Chichester National Parks, Ningaloo Marine Park and the enlargement of the Leeuwin-Naturaliste National Park. Bert was also appointed President of the National Parks Authority in WA in 1980 and President of the Perth Zoological Gardens Board from 1979–85. For several years from 1989 Bert also chaired the Western Australian Greenhouse Coordination Council and truly it can be said that nothing to do with the environment could happen in WA without Bert's involvement!

His involvement in Government

was a direct response to this perceived need to establish reserves for the protection of WA's rapidly-diminishing wildlife. Very early on Bert saw islands with populations of marsupials, such as Rottneest and Barrow Island, as 'natural experiments' from which one could gauge the area needed to establish reserves that would protect a full complement of vertebrate and particularly, marsupial, species (13,14). Barrow Island, with an area of approximately 50,000 acres (22,250 ha), was taken as a templet for the minimum size for a reserve that was capable of maintaining a full complement of marsupials (15).

Bert tackled the problem of managing remnants of native vegetation in the wheatbelt area of WA in a series of thoughtful papers based on his theory of ecosystem evolution and function developed in relation to the nutrient cycle and the rôles played by rare and abundant species. Restoring what is one of the most devastated ecosystems in Australia was always going to be a big ask, but Bert tackled it with his usual systematic approach. He reviewed the problems and suggested an approach based on the restoration of essential ecological services now lacking because of the loss of biodiversity (16–18). He argued that rare species were particularly important in the wheat-belt area because they now perform vital ecological services once carried out by a multiplicity of other species, long since gone – and this was Bert's main argument

for their conservation (19–21). His categorising nutrient response modes following perturbations such as fire, flood, drought and the uprooting of trees was particularly insightful and helped define the ecological poverty of the area now being cropped solely for cereal plants (22).

Honours and Awards

Bert was a Fulbright Scholar in 1950–51 and received a Carnegie Travelling Fellowship in 1958. He was elected a Fellow of the Australian Academy of Science (AAS) in 1969 and shared the Britannica Australia Award for Science in 1970 with Harry Waring *‘For their distinguished contributions to the ecology and conservation of Australian marsupials.’* He was made an Honorary Foreign Member of the American Society of Ichthyologists and Herpetologists (ASIH) in 1975 and in 1981, in recognition of both his public service and his scientific research, he was made a Commander in the Civil Division of the Order of the British Empire. He was made an Honorary Member of the Royal Society of Western Australia in 1982 and their medallist in 1995 (7). He was awarded an Honorary DSc from The University of Western Australia (UWA) in 1987 and received the Ecological Society of Australia Medal in 1988. He was made a Fellow of the Australian and New Zealand Association for the Advancement of Science (ANZAAS) in 1985 and received the von Mueller medal in Hobart, Tasmania, in 1990. Amongst Bert’s

many medals is also one from the Caterpillar Club – for servicemen and women whose lives were saved by parachutes – made of silk!

Bert Main was a most unusual and highly gifted man. He had humble origins but his impact on three generations of students has been enormous and his legacy is there for all generations to see in the form of the numerous parks and reserves that he helped create. Bert did not suffer fools gladly, and he set out early in life to change the environment in which he found himself. In this he has been extraordinarily successful and left us with the hope that the many environmental errors of the past are not irrevocable.

His to-be-remembered advice to young graduands in the midst of a mining boom in 1987, on the occasion of his receiving an Honorary Doctorate from UWA was:

“For we live in a world ruled by accountants and tally-keepers, for whom form-filling is the peak of intellectual endeavour. Such ciphers have no knowledge of history, not any concept of how long it may be before pieces of information fall into place. It will need good presentation and outstanding advocacy to convince them that inquiry in the form of research must go on. That it is not possible to endlessly quarry established knowledge and theories for the quick fix and rapid monetary reward, an attitude which is so prevalent today. Such

behaviour can be likened to a mining company which does no exploration until the lode currently being exploited has been exhausted."

ACKNOWLEDGEMENTS

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